Notice of Allowability	Application No.	Applicant(s)	
	10/815,144	BORIGHT ET AL.	
	Examiner	Art Unit	
	Victor J. Taylor	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *3/31/2004*.

2. ☒ The allowed claim(s) is/are *1-53*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 14
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Drawings

1. The drawings were received on November 24, 2003. These drawings are approved.

Prior Art

2. The prior art made of record and not relied upon is considered pertinent to applicant.

I. Art A of Furuhashi et al., US 6,697,065 in class 345/426 is cited for the method of image processing the 3-D space observed with a viewpoint for fogging an object 12 in figure 1. He further teaches computer computations and generation of a fog base 22 and teaches the haze processing 34 using the raster 18 and displays the data image 38 in figure 2. He further teaches the use a space data component 100 and the density data component 120 using masking 132 in figure 4 and teaches the image processing method to provide for realistic images in lines 35 of column 1. He teaches the 2-D coordinate data and the interpolation-computing unit 28 with coordinate inputting to generate 3-D images in lines 15-50 of column 4.

II. Art B of Viggh US 2005/0036661 A1 in class 382/109 is cited for the method of spatial surface prior information reflectance estimation (SPIRE) algorithms using the physics based code to extend the atmospheric compensation capabilities in lines 1-10 paragraph 0019 on page 3. He further teaches using algorithms to estimate spectral reflectance in remote sensing imagery in the DTFT in column 3 on page 3and further discloses the multi-spectral data in paragraph 0050 in page 5.

Allowable Subject Matter

3. Claims 1-53 are allowed.

4. The following is an examiner's statement of reasons for allowance:

The method and apparatus for the computer implemented method for cloud cover assessment with the method steps for determining the normal difference snow index or NDSI and the normal difference vegetation index or NDVI and the first threshold data and the secondary image data comparator with method steps for determining the cloud data points using visible near infrared data and short wavelength infrared data with the steps to compute a first comparison of a cirrus cloud band reflectance value and with steps to classify the data point as a cloud point determined by the cirrus cloud reflectance data point and the threshold of the threshold cirrus cloud band reflectance value with the related empirically derived land cover dependent thresholds for classifying the data points as a cloud point or a non cloud point and to determine the image data is not found in the cited art of record. Therefore:

I. The method in claim 1 for determining whether a cloud data point in and of an image indicates a cirrus cloud with method steps including using the visible data or the near infrared data or the short wavelength infrared data with the computer computation method steps for "selecting a data point from an imaging study of an area potentially covered by at least one of visible clouds and sub-visible clouds"...[and] with steps for "determining whether the data point is covered by visible cloud"...[and/or] in combination with the particularly claimed steps wherein "determining whether the data

point indicates presence of a sub-visible cloud including"...[and] in combination with the particular claimed comparing steps for "comparing a cirrus-band reflectance of the data point with a sub-visible cirrus-band reflectance threshold and classifying the data point as a sub-visible cloud point if the cirrus-band reflectance of the data point exceeds the sub-visible cirrus band reflectance threshold" to commutate and determine if the data point indicates the presence of a cirrus cloud is not found in the cited art of record.

The prior Art A of Furuhashi et al., teaches the method of image processing the 3-D space observed with a viewpoint for fogging an object 12 in figure 1. He further teaches computer computations and generation of a fog base 22 and teaches the haze processing 34 using the raster 18 and displays the data image 38 in figure 2. He further teaches the use a space data component 100 and the density data component 120 using masking 132 in figure 4 and teaches the image processing method to provide for realistic images in lines 35 of column 1. He teaches the 2-D coordinate data and the interpolation-computing unit 28 with coordinate inputting to generate 3-D images in lines 15-50 of column 4.

The prior Art B of Viggh teaches the method of spatial surface prior information reflectance estimation (SPIRE) algorithms using the physics based code to extend the atmospheric compensation capabilities in lines 1-10 paragraph 0019 on page 3. He further teaches using algorithms to estimate spectral reflectance in remote sensing imagery in the DTFT in column 3 on page 3and further discloses the multi-spectral data in paragraph 0050 in page 5.

Therefore, the prior art Furuhashi et al., and The prior art of Viggh in combination or alone does not teach the present limitation of the claimed combination limitation.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Claims 2-10 are dependent on the allowed independent claim 1 and are allowed at least for the reasons cited above.

II. The method in claim 11 for determining whether a data point of an image indicates the presence of a cloud with method steps including using visible data and near-infrared data and short-wavelength infrared data with the computer computation method steps for "selecting a data point from an imaging study of an area potentially covered by at least one of visible clouds and sub-visible clouds"...[and] with steps for "determining whether the data point indicates presence of a visible cloud"...[and/or] in combination with the particularly claimed steps wherein "when it is determined that the data point does not indicate the presence of a visible cloud"...[and] "determining whether the data point indicates presence of a sub-visible cloud including" with the combined and the particularly claimed steps for "comparing a cirrus-band reflectance of the data point with a sub-visible cirrus-band reflectance threshold" [and] "classifying the data point as a sub-visible cloud point if the cirrus-band reflectance of the data point exceeds the sub-visible cirrus band reflectance threshold" to determine if the data point indicates the presence of a cirrus cloud is not found in the cited art of record.

The prior Art A of Furuhashi et al., teaches the method of image processing the 3-D space observed with a viewpoint for fogging an object 12 in figure 1. He further

teaches computer computations and generation of a fog base 22 and teaches the haze processing 34 using the raster 18 and displays the data image 38 in figure 2. He further teaches the use a space data component 100 and the density data component 120 using masking 132 in figure 4 and teaches the image processing method to provide for realistic images in lines 35 of column 1. He teaches the 2-D coordinate data and the interpolation-computing unit 28 with coordinate inputting to generate 3-D images in lines 15-50 of column 4.

The prior Art B of Viggh teaches the method of spatial surface prior information reflectance estimation (SPIRE) algorithms using the physics based code to extend the atmospheric compensation capabilities in lines 1-10 paragraph 0019 on page 3. He further teaches using algorithms to estimate spectral reflectance in remote sensing imagery in the DTFT in column 3 on page 3and further discloses the multi-spectral data in paragraph 0050 in page 5.

Therefore, the prior art Furuhashi et al., and The prior art of Viggh in combination or alone does not teach the present limitation of the claimed combination limitation.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Claims 12-17 are dependent on the allowed independent claim 11 and are allowed at least for the reasons cited above.

III. The computer readable medium in claim 18 for determining a data point of the imaging study indicates the presence of a sub visible cloud using data that includes visible data or near infrared data or short wavelength infrared data with the computer

readable steps for cloud data point processes using steps for "a first computer program portion adapted to select a data point from an imaging study of an area potentially covered by at least one of visible clouds and sub-visible clouds"...[and] with steps for "a second computer program portion adapted to determine whether the data point indicates presence of a sub-visible cloud including"...[and/or] in combination with the particularly claimed steps wherein "a third computer program portion adapted to compare a cirrus-band reflectance of the data point with a sub-visible cirrus-band reflectance threshold"...[and] in combination with the steps for "a fourth computer program portion adapted to classify the data point as a sub-visible cloud point if the cirrus-band reflectance of the data point exceeds the sub-visible cirrus band reflectance threshold" to determine if the data point indicates the presence of a cirrus cloud is not found in the cited art of record.

The prior Art A of Furuhashi et al., teaches the method of image processing the 3-D space observed with a viewpoint for fogging an object 12 in figure 1. He further teaches computer computations and generation of a fog base 22 and teaches the haze processing 34 using the raster 18 and displays the data image 38 in figure 2. He further teaches the use a space data component 100 and the density data component 120 using masking 132 in figure 4 and teaches the image processing method to provide for realistic images in lines 35 of column 1. He teaches the 2-D coordinate data and the interpolation-computing unit 28 with coordinate inputting to generate 3-D images in lines 15-50 of column 4.

The prior Art B of Viggh teaches the method of spatial surface prior information reflectance estimation (SPIRE) algorithms using the physics based code to extend the atmospheric compensation capabilities in lines 1-10 paragraph 0019 on page 3. He further teaches using algorithms to estimate spectral reflectance in remote sensing imagery in the DTFT in column 3 on page 3and further discloses the multi-spectral data in paragraph 0050 in page 5.

Therefore, the prior art Furuhashi et al., and The prior art of Viggh in combination or alone does not teach the present limitation of the claimed combination limitation.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Claims 19-27 are dependent on the allowed independent claim 18 and are allowed at least for the reasons cited above.

IV. The computer readable medium in claim 28 having stored instructions for determining whether a data point of an imaging study indicates a presence of a cloud using data including visible, near-infrared, and short wavelength infrared data instructions for "a first computer program portion adapted to select a data point from an imaging study of an area potentially covered by at least one of visible clouds and sub-visible clouds"...[and] with steps for "a second computer program portion adapted to determine whether the data point indicates presence of a visible cloud"...[and/or] in combination with the particularly claimed steps wherein "a third computer program portion adapted to determine, when it is determined that the data point does not indicate the presence of a visible cloud, whether the data point indicates presence of a sub-

visible cloud including: a fourth computer program portion adapted to compare a cirrus-band reflectance of the data point with a sub-visible cirrus-band reflectance threshold"...[and] in combination with the steps for "a fifth computer program portion adapted to classify the data point as a sub-visible cloud point if the cirrus-band reflectance of the data point exceeds the sub-visible cirrus band reflectance threshold" to determine if the data point indicates the presence of a cirrus cloud is not found in the cited art of record.

The prior Art A of Furuhashi et al., teaches the method of image processing the 3-D space observed with a viewpoint for fogging an object 12 in figure 1. He further teaches computer computations and generation of a fog base 22 and teaches the haze processing 34 using the raster 18 and displays the data image 38 in figure 2. He further teaches the use a space data component 100 and the density data component 120 using masking 132 in figure 4 and teaches the image processing method to provide for realistic images in lines 35 of column 1. He teaches the 2-D coordinate data and the interpolation-computing unit 28 with coordinate inputting to generate 3-D images in lines 15-50 of column 4.

The prior Art B of Viggh teaches the method of spatial surface prior information reflectance estimation (SPIRE) algorithms using the physics based code to extend the atmospheric compensation capabilities in lines 1-10 paragraph 0019 on page 3. He further teaches using algorithms to estimate spectral reflectance in remote sensing imagery in the DTFT in column 3 on page 3and further discloses the multi-spectral data in paragraph 0050 in page 5.

Therefore, the prior art Furuhashi et al., and The prior art of Viggh in combination or alone does not teach the present limitation of the claimed combination limitation.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Claims 29-34 are dependent on the allowed independent claim 28 and are allowed at least for the reasons cited above.

V. The system in claim 35 for determining whether a data point of an imaging study indicates a presence of a sub-visible cloud using data including visible, near-infrared, and short wavelength infrared data with "a data point selector to configured to select a data point from an imaging study of an area potentially covered by at least one of visible clouds and sub-visible clouds"...[and] with "a sub-visible cloud detector configured to determine whether the data point indicates presence of a sub-visible cloud including: a cirrus-band comparator configured to compare a cirrus-band reflectance of the data point with a sub-visible cirrus-band reflectance threshold"...[and/or] in combination with the particularly claimed steps wherein "a data point classifier configured to classify the data point as a sub-visible cloud point if the cirrus-band reflectance of the data point exceeds the sub-visible cirrus band reflectance threshold" used to determine if the data point indicates the presence of a cirrus cloud is not found in the cited art of record.

The prior Art A of Furuhashi et al., teaches the method of image processing the 3-D space observed with a viewpoint for fogging an object 12 in figure 1. He further teaches computer computations and generation of a fog base 22 and teaches the haze

processing 34 using the raster 18 and displays the data image 38 in figure 2. He further teaches the use a space data component 100 and the density data component 120 using masking 132 in figure 4 and teaches the image processing method to provide for realistic images in lines 35 of column 1. He teaches the 2-D coordinate data and the interpolation-computing unit 28 with coordinate inputting to generate 3-D images in lines 15-50 of column 4.

The prior Art B of Viggh teaches the method of spatial surface prior information reflectance estimation (SPIRE) algorithms using the physics based code to extend the atmospheric compensation capabilities in lines 1-10 paragraph 0019 on page 3. He further teaches using algorithms to estimate spectral reflectance in remote sensing imagery in the DTFT in column 3 on page 3and further discloses the multi-spectral data in paragraph 0050 in page 5.

Therefore, the prior art Furuhashi et al., and The prior art of Viggh in combination or alone does not teach the present limitation of the claimed combination limitation.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Claims 36-44 are dependent on the allowed independent claim 35 and are allowed at least for the reasons cited above.

VI. The system in claim 45 for determining whether a data point of an image study indicates a presence of a cloud using visible data or near infrared data or short wavelength infrared data with "a data point selector configured to select a data point from an imaging study of an area potentially covered by at least one of visible clouds

and sub-visible clouds"...[and] "a visible cloud detector to determine whether the data point indicates the presence of a visible cloud"...[and/or] in combination with the particularly claimed "sub-visible cloud detector configured to determine when the visible cloud detector has determined the data point does not indicate the presence of a visible cloud, whether the data point indicates presence of a sub-visible cloud including"...[and] in combination with "a cirrus-band comparator configured to compare a cirrus-band reflectance of the data point with a sub-visible cirrus-band reflectance threshold"...[and] with "a data point classifier configured to classify the data point as a sub-visible cloud point if the cirrus-band reflectance of the data point exceeds the sub-visible cirrus band reflectance threshold" to determine if the data point indicates the presence of a cirrus cloud is not found in the cited art of record.

The prior Art A of Furuhashi et al., teaches the method of image processing the 3-D space observed with a viewpoint for fogging an object 12 in figure 1. He further teaches computer computations and generation of a fog base 22 and teaches the haze processing 34 using the raster 18 and displays the data image 38 in figure 2. He further teaches the use a space data component 100 and the density data component 120 using masking 132 in figure 4 and teaches the image processing method to provide for realistic images in lines 35 of column 1. He teaches the 2-D coordinate data and the interpolation-computing unit 28 with coordinate inputting to generate 3-D images in lines 15-50 of column 4.

The prior Art B of Viggh teaches the method of spatial surface prior information reflectance estimation (SPIRE) algorithms using the physics based code to extend the

atmospheric compensation capabilities in lines 1-10 paragraph 0019 on page 3. He further teaches using algorithms to estimate spectral reflectance in remote sensing imagery in the DTFT in column 3 on page 3and further discloses the multi-spectral data in paragraph 0050 in page 5.

Therefore, the prior art Furuhashi et al., and The prior art of Viggh in combination or alone does not teach the present limitation of the claimed combination limitation.

It is these limitations expressed in each of these claims and not found, taught, or suggested in the prior art of record, that makes these claims allowable over the prior art.

Claims 46-53 are dependent on the allowed independent claim 1 and are allowed at least for the reasons cited above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 517-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VJ Taylor
November 28, 2005

John Barlow
Supervisory Patent Examiner
Technology Center 2800